# Zero Retries issue 0116 2023-09-15

***Zero Retries is an independent newsletter promoting technological innovation in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication, with 900+ subscribers.***

**About Zero Retries**

## Steve Stroh N8GNJ, Editor

**Jack Stroh, Late Night Assistant Editor Emeritus**

### In this issue:


- **Request To Send**
- **Packet Radio Magazine Issues Now Online**
- **New Audio Interface - Universal Radio Modem**
- **The TEXNET Packet Switching Network**
- **ZR > BEACON**
    - **CHART - Completely Hackable Amateur Radio Telescope**
    - **VoCore - 1 Square Inch Linux Computer**
    - **Coin Cell Extender**
    - **D-RATS Is Being Maintained**
    - **MMDVM-TNC (potential) 19200 bps mode!**
- **Feedback Loop**
- **Join the *Fun* on Amateur Radio**
- **Closing The Channel**


***Web version of this issue - https://www.zeroretries.org/p/zero-retries-0116***

### Request To Send

*Editorial by Steve Stroh N8GNJ*

**Prefers to remain anonymous #2 is the Newest Zero Retries Founding Member**

My thanks to new Founding Member 0005 who prefers to remain anonymous, joining:
Founding Member 0000 - Steven Davidson K3FZT
Founding Member 0001 - Chris Osburn KD7DVD
Founding Member 0002 - Don Rotolo N2IRZ
Founding Member 0003 - William  Arcand W1WRA
Founding Member 0004 - Prefers to remain anonymous #1

If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly*appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR - Zero Retries Administrivia - Activating Payment Options.

**Zero Retries Interesting Conferences**

I try to keep the Zero Retries Guide to Interesting Conferences sub-page of Zero Retries up to date, and add to it when I see a Zero Retries Interesting conference mentioned. Thus I was delighted to discover the 2024 EME Conference which will be in Trenton, New Jersey USA 2024-08-08 thru 11. The EME Conference has been held bi-annually for two decades now and it's an international conference that regularly rotates between different countries. It's a measure of technological innovation in Amateur Radio that such a niche (Amateur Radio) of a niche (space communications) of a niche (Earth Moon Earth) technical conferences are occurring, and perhaps even growing.

**Pacificon, *Ho!***

As I write this issue, I'm "on the road again" for another personal trip, and then back to Bellingham for a few weeks. Through an unusual set of circumstances, it looks likely that, for the first time, I will be able to attend Pacificon 2023, in late October, in San Ramon, California USA. It's a long day's drive for us from Bellingham on I-5, but doable. The schedule looks interesting and there are a fair number of interesting folks scheduled to be speakers at the Technical Forums.

And of course, there are the usual techie delights of having a loose schedule in the Bay Area, California, including one of my usual stops, the Computer

History Museum1 and hopefully a visit to a few of the remaining electronics surplus stores in the Bay Area (recommendations appreciated).

If you're a Zero Retries reader also attending Pacificon and would like to meet up, please drop me a note. If there are enough of us, perhaps a meetup could be arranged.

Leave a comment

Share

---

### Packet Radio Magazine Issues Now Online

By Steve Stroh N8GNJ

*Internet Archive's Digital Library of Amateur Radio & Communications (DLARC) now has more than 90,000 items online that relate to Amateur Radio & Communications online. A few of those items are a bit more special than others (to me).*

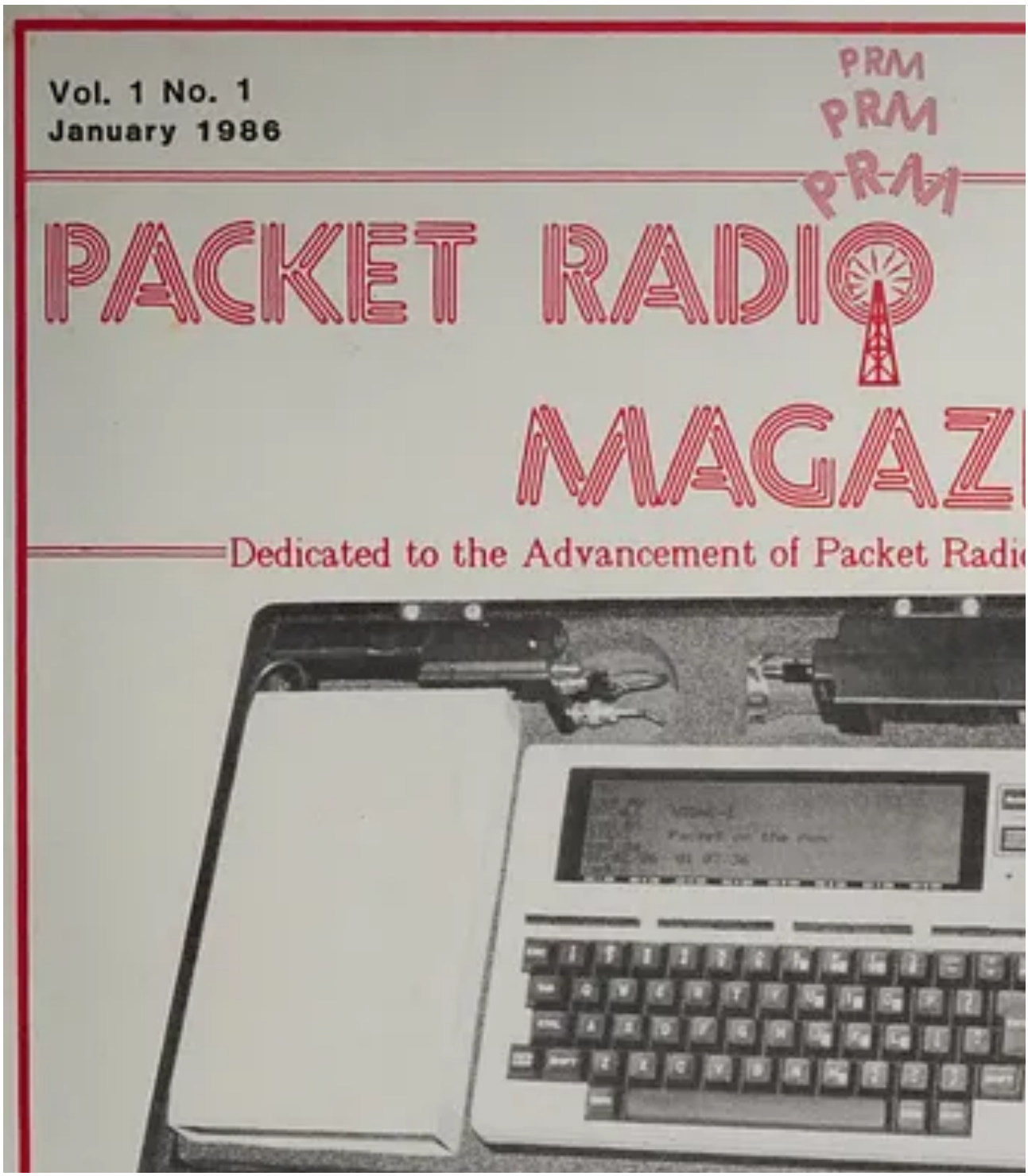

Image courtesy of Internet Archive / Library of Amateur Radio & Communications

I'm *delighted* to report that some of those 90,000+ items are issues of **Packet Radio Magazine (PRM)** that I contributed to DLARC:

**January 1986 February 1986 March 1986,**

**April 1986 May 1986 June 1986**

**July 1986 August 1986 September 1986**

**October 1986 November 1986 December 1986**

**January / February 1987 March 1987 April 1987**

After holding onto those unique items for 37 years now, it's a thrill to see them available online accessible to everyone on the planet. Being able to read them one after another ("binge" them), you can read about the rapid evolution of Amateur Radio Packet Radio technology during those two formative years.

I think that April 1987 was the last issue of Packet Radio Magazine as Founder / Editor Gwyn Reedy W1BEL (Silent Keyboard) was just trying to do too much in addition to publishing PRM:

> The combination of being in a business which manufactures amateur products, and being very active in leadership positions in the amateur world is not working out. I have a clear conscience about my actions throughout this period, but like Senator Hart's recent claim about his girlfriend that 'She and I always slept on separate boats', it is not the truth, but what people choose to believe that counts. I do not want to cause my many good friends any additional embarrasment or inconvenience. My continued holding of office while lacking time to contribute to FADCA and PRM have caused me to hurt the very organizations and activities that I desire to support. I have submitted my resignation as both PSR Editor and TAPR Director, and President of FADCA. I plan to finish my term as FADCA Director to provide what support I can.
>
> I am opening the job of publishing PRM to any person or group that wishes to continue this work. The final decision in that matter will be up to the FADCA Board of Directors. If no alternative method of producing the magazine Packet Status Register, is found by mid summer, then publication will be suspended and subscriptions refunded.

The ability to read that issue online and develop that block quote is a perfect illustration of why I decided to send my copies of PRM to Internet Archive for inclusion in DLARC. IA did a fantastically better job of digitizing PRM than I would have been able to do, including not just generating the usual PDF, but scanned it at high resolution and used their very sophisticated Optical Character Recognition (OCR) to allow me to cut and paste the above quote (with a bit of editing). And, IA will hopefully keep PRM online in perpetuity, for anyone in the world to read. Arguably, I might have been able to accomplish the former, but certainly not the latter.

And… the story of W1BEL and PRM is a cautionary tale, at least for me. None of us individually *can do it all*, so the choice is that one can focus their energies on one primary project as I'm currently doing with Zero Retries, or one can build a team to tackle multiple projects (but that requires a lot of coordination).

Thanks W1BEL - you're one of the rare ones that made *multiple* unique dents in the universe!

Leave a comment

Share

---

### New Audio Interface - Universal Radio Modem

By Steve Stroh N8GNJ

*One would think that audio interfaces for Amateur Radio data communication would be a solved problem by now, but there's always new approaches and designs.*

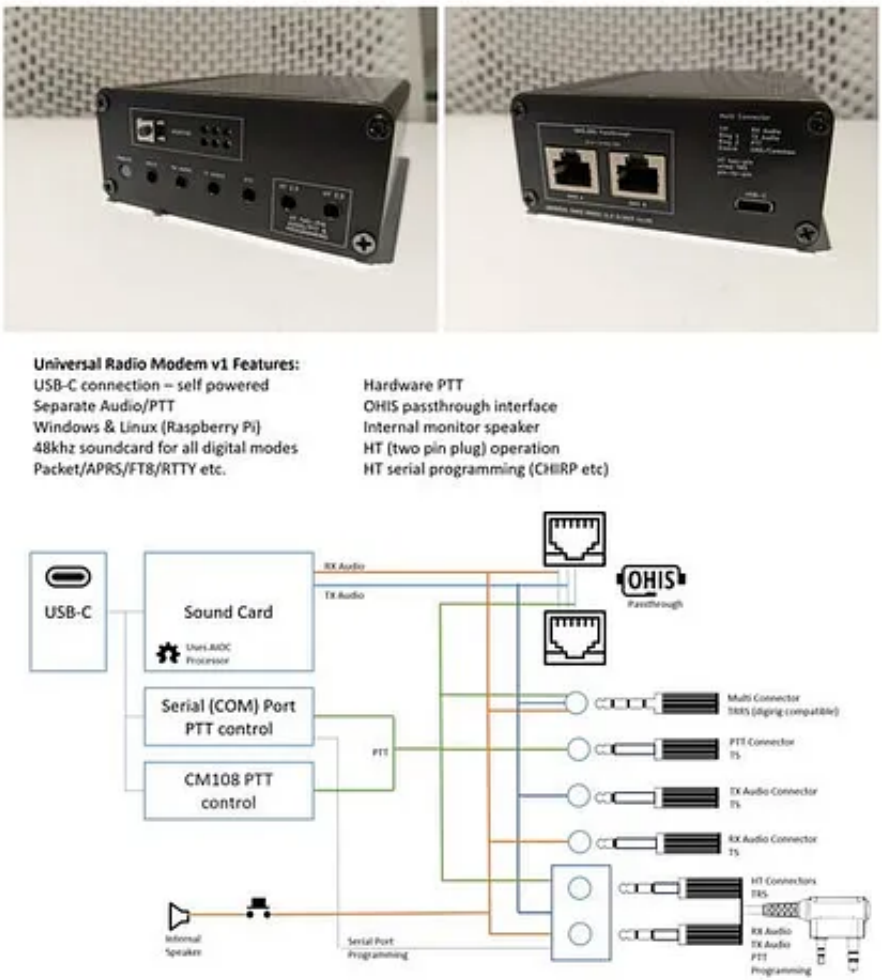


Image courtesy of Mark Herbert via Facebook

From Mark Herbert on the Facebook group **DireWolf Packet Radio, APRS and more.**:

> Latest V1 version of my Universal Radio Modem is being tested.
>
> It works great with DireWolf for APRS/Packet modes etc.
>
> This version has added support for the HT ( Baofeng etc.) two pin connector and provides full audio & PTT support (not VOX) as well as serial programming functionality.
>
> There's also OHIS comparability for where to provide sound card and PTT support to this emerging standard.
>
> Initial run will be 5 fully cased units

As with many such developments, the only information available, including contact info, is posted only on Facebook. I'm mentioning it here because it has a few unique aspects, such as offering Push To Talk inputs from both serial port and CM108.

Leave a comment

Share

---

## The TEXNET Packet Switching Network

By Steve Stroh N8GNJ

*TEXNET was an Amateur Radio Packet Radio network architecture and network operated by Texas Packet Radio Society (TPRS) that was ahead of its time. TEXNET's capabilities addressed a number of deficiencies inherent in "pure AX.25" networks (IE, only using the built-in digipeater capabilities to build networks).*

I was looking for something else, and ran across a series of articles in Ham Radio Magazine about TEXNET (March 1987, April 1987, and June 1987) by Thomas Aschenbrenner WB5PUC, and Thomas McDermott, N5EG. The articles detailed the architecture and hardware of TEXNET. Because I was only a sporadic subscriber to Ham Radio, I don't recall ever having seen this article. TEXNET's architecture was ahead of its time, and addressed issues that still plague Amateur Radio Packet Radio networks to this day.

> In response to the phenomenal growth of packet radio over the past three years, many packet repeater ("digipeater") networks have been developed, allowing packet communications to be extended over many hundreds, even thousands, of miles. The operation of these digipeater systems has not been without some significant problems, however; most notably, congestion and difficulty in maintaining connections through more than about four or five individual repeaters, with excessive time delays between endpoints.
>
> In an effort to resolve these problems, we decided to establish a rapid, reliable network that would allow Texas packet radio operators to communicate effectively over distances of several hundred miles in real time. We now have TEXNET, a four-node network with some of the communication trunks between nodes operating at 9600 bits per second.
>
> In developing TEXNET, our goal was to minimize the cost of building a network node, yet provide very small transmission delay time between users. After the system was in place, we added additional services to the network without degrading the quick response time.

I think that these TEXNET articles are worth reading for those that are contemplating building (or rebuilding) Amateur Radio Packet Radio networks, or just trying to understand the issues of Amateur Radio Packet Radio networks..

Texnet Part 1 2 3 Ham Radio 1987
6.29MB · PDF file
Download
Download

Leave a comment

Share

---

## ZR > BEACON

By Steve Stroh N8GNJ

*Short mentions of Zero Retries Interesting items*.

**CHART - Completely Hackable Amateur Radio Telescope**

> Welcome to the CHART project! CHART stands for Completely Hackable Amateur Radio Telescope. Our goal with this project is to create an easy to navigate system of tutorials that will lead to you in building your own radio telescope from the comfort of your home or classroom. It is very important to us that that radio astronomy is as accessible as possible to whoever is interested, so we strove to keep the creation of this project as cheap as possible.

The CHART Project reminds me of two somewhat related Citizen Science Radio Astronomy organizations, both of which, like CHART, encourage the construction of personally-owned radio astronomy systems:

- SETI League promotes building of Amateur Radio Telescopes to support the Search for Extraterrestrial Intelligence.
- Society of Amateur Radio Astronomers (SARA) which promotes Amateur Radio Astronomy (both "non-professional" and by Amateur Radio Operators)

---

**VoCore - 1 Square Inch Linux Computer**

> VoCore is open hardware and runs Linux (OpenWrt). It has 128MB DDR, WIFI, USB, UART, I2C, SPI, 20+ GPIOs but only one inch square(25.8mm). It will help you to make a smart house, study embedded system or even make the tiniest router in the world.

This doesn't have anything specific to do with Amateur Radio (unless, for fun, the AREDN developers decide to port AREDN to it given OpenWrt is already running on it). But the mind reels that this cheap and physically small device is sophisticated enough to run Linux - it's not a microcontroller that gets loaded with a single-task application, it's running *Linux*.2

---

**Coin Cell Extender**

From Tindie:

> Some products have a little CR2032 coin cell buried in the depths of the circuitry. Usually it lasts a long time but not always. Even if you only need to change it once every few years, when you do, it can be a painful disassembly and access process. With this little item you can move the battery out to an easy-to-access spot, and make that chore easier.

A hidden vulnerability of a lot of consumer (and Amateur Radio) electronics is an internal lithium coin cell battery. It's easy to forget they're inside the unit, especially when the unit is placed into storage. I've heard that such batteries are a particular bane of Kantronics KPC-3 units; the battery is forgotten about until the unit fails (or doesn't power up when brought out of storage) and the battery failed, leaked, and corroded the printed circuit board traces underneath.

Now that we know better about "out of sight, out of mind" coin cell batteries, the Coin Cell Extender seems like a good idea for units such as a KPC-3

installed as a remote digipeater. Once it's installed, it's hard to forget about the battery and thus replace it periodically. I bought a few and perhaps replace the coin cell holder with a pair of lithium AA batteries in series for even longer capacity.

The same vendor offers a similar product - 2032 Coin Cell Surrogate.

---

**D-RATS Is Being Maintained**

D-RATS ~~was~~ is an interesting application for using the low-speed data capability of D-Star radios. While the 900 bps data stream in all D-Star radios wasn't that spectacular, it *was useful* when you take into consideration that *every* D-Star radio (including portables) had this data capability built in, *and* it worked through every D-Star repeater. From the original D-RATS brochure:

> [ D-RATS is] a multi-platform integrated tool for com- munication using D-STAR radios. With only a pair of radios (or an entire repeater stack) a variety of data transmission methods are supported, including:
>
> - Instant-message chat
> - Automatic beacon messages
> - File transfers with error detection • Structured forms
> - GPS position reports
> - And much more!

For a time, D-RATS wasn't being maintained as the Python libraries it was built with had aged out of current software. But this note on the D-Rats mailing list by Edfel
Rivera KP4AJ :

> **GitHub - Latest code, fixes and enhancements!**
>
> I strongly recommend you follow D-Rats GitHub! If you can learn how to clone the repository and use in your platform, you will be using latest code with many fixes and enhancements. Also you can browse Issues to follow progress and areas of improvement. Very pleased the repeater subsystem getting enhancements. Very positive about what next releases will bring into D-Rats!

… was a reminder that D-RATS *is* being maintained (if you know where to look). So, for the latest on D-RATS, check the mailing list and the D-Rats repository on GitHub.

It's really a shame that Icom created, but barely acknowledges the **D-Star DV Fast Data (DVFD) mode** implemented only in a few D-Star radios. DVFD uses most of the D-Star 4800 bps data stream (originally partitioned into 2400 bps digital voice, 1200 bps Forward Error Correction, and 1200 bps for "data" including callsigns, etc.) If DVFD had been available in the heyday of D-RATS, then I think D-Star being used for data would have been a lot more popular. Unfortunately, DVFD was implemented too late to influence D-Star's declining popularity in favor of Digital Mobile Radio (DMR).

---

**MMDVM-TNC (potential) 19200 bps mode!**

As part of an ongoing email exchange with Jonathan Naylor G4KLX about the MMDVM-TNC project, G4KLX casually mentioned that it may well be possible for the MMDVM-TNC project to implement a *19200 bps mode* in addition to the 9600 bps mode. See the "mode3" branch of the MMDVM-TNC GitHub page. Again, this is exciting because this will be implemented in a 12.5 kHz channel, using existing MMDVM hardware (modems).

In response to my gushing to him about the potential of a 19200 bps mode, G4KLX reminded me that development of the MMDVM-TNC 9600 bps mode isn't yet complete, and completing *that* is his priority of the moment. But, still, ***wow*** that Amateur Radio might have that kind of high speed option (and, again, in a 12.5 kHz channel) is very, very cool and would put the MMDVM-TNC nearly on par with the high speed (25 kbps) of VARA FM and faster than any other Amateur Radio modems (that I'm aware of).

---

## Feedback Loop

Zero Retries 0115 generated a number of comments! Thanks Steven Davidson, Ria Jairam N2RJ, Cale K4HCK, Juan Ignacio, Rich Casey N5CSU, and N6UOW.

---

## Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
**Join the Fun on Amateur Radio** for some pointers.

**Zero Retries Frequently Asked Questions (FAQs)** — In development 2023-02.

---

## Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*

- **Founding Members who generously support Zero Retries financially:**
  Founding Member 0000 - Steven Davidson K3FZT
  Founding Member 0001 - Chris Osburn KD7DVD
  Founding Member 0002 - Don Rotolo N2IRZ
  Founding Member 0003 - William  Arcand W1WRA
  Founding Member 0004 - Prefers to remain anonymous #1
  Founding Member 0005 - Prefers to remain anonymous #2

- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

**Want to Support Zero Retries?**

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.

- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org

- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

**These blogs and newsletters regularly feature Zero Retries Interesting content:**

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.

- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.

- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.

- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!

- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.

- TAPR Packet Status Register has been published continuously since 1982.

- Other Substack Amateur Radio newsletters recommended by Zero Retries.

**These YouTube channels** regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA

- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)

- Modern Ham by Billy Penley KN4MKB

- Tech Minds by Matthew Miller M0DQW

The Substack email publishing platform makes Zero Retries possible. I recommend it for publishing newsletters.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ~~100~~ ~~200~~ ~~300~~ ~~400~~ *500* ~~600~~ ~~700~~ ~~800~~ *900+* other readers:

Subscribe now

***Please tell your co-conspirators about Zero Retries — just click***:

Share Zero Retries

Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

**Zero Retries (N8GNJ) is on Mastodon** — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA.

2023-09-15

If you'd like to reuse an article in this issue, for example for club or other newsletters, just ask. Please provide credit for the content to me and any other authors.

All excerpts from other authors or organizations, including images, are intended to be fair use.

Portions Copyright © 2021, 2022, and 2023 by Steven K. Stroh.

**Blanket permission granted for TAPR to use any Steve Stroh content for the TAPR Packet Status Register (PSR) newsletter (I *owe* them from *way* back).**

1

I'll be curious if the Tadpole SPARCbook that I donated to CHM in 2017 will be on display.

2

My vintage is showing with this one; the memory of opening the mailbox and seeing the Altair on the cover of the January, 1975 issue of Popular Electronics is permanently seared into my brain. Wow - finally, a *real computer* that's "affordable". But hey, it's *my* newsletter 😀